Dr. Edward Weiler
Associate Administrator for Space Science
NASA Headquarters
Washington, DC 20546

April 15, 2004

Dear Dr. Weiler,

The Space Science Advisory Committee (SScAC) met in public session March 25-26, 2004 at the Grand Hyatt Hotel in Washington, DC. The President's Exploration Policy created the overall context to the meeting and dominated our discussions. We are grateful to members of your staff and others that spent their valuable time with us. We hope that our deliberations and recommendations will be a positive contribution to the affairs of OSS and NASA.

The meeting was the final meeting for two of our members, Roderick Heelis and Paul Knappenberger. Their terms will expire prior to our next scheduled meeting in July. We appreciate the great service they have provided to our community. All members of the committee were in attendance except for the unavoidable absence of David Deamer. As we have come to expect, the meeting ran flawlessly under the direction of Marc Allen, Marian Norris and Ana Wilson.

The first day of the two day meeting was devoted to the Division and Subcommittee reports. Anne Kinney, Jim Garvin, Jay Bergstrahl and Richard Fisher summarized the issues in their respective divisions. Rocky Kolb, Dave Spergel, Jonathan Lunine and Michelle Thomsen reviewed the activities and results of the corresponding subcommittee meetings. The second day Marc Allen presented the plans for the strategic/roadmap planning process. Richard Fisher presented information of the state of the Sounding Rocket program. Admiral Steidle presented the final briefing of the day on his plans for code T. The agenda allowed time needed to respond to a request from NAC on the impacts of the Exploration Policy and to prepare detailed recommendations for OSS.

During the lunch hour on both days, we were treated to outstanding science talks. Mike Werner discussed the new results from the Spitzer telescope, the new infrared member of the great observatories, formerly SIRTF. The photographs were dazzling. On Friday, Steve Saunders discussed the evidence for liquid water on the surface of Mars using new results from the Mars rovers. Photographic and analytical evidence make a very strong case.

The committee prepared a letter for the President's Commission on Implementation of U.S. Space Exploration Policy expressing our support for a strong science component in

the program. A copy of that letter is attached. In addition, responses to the NASA Advisory Council request for views on the Exploration Policy and the individual subcommittee reports are attached.

Sincerely

Andrew B. Christensen
SScAC, Chair

Attachments:
SScAC Recommendations
SECAS Report
SEUS Report
SESS Report
OS Report

SScAC RECOMMENDATIONS

- Over the past quarter century Space Science has been the most productive of NASA's endeavors and has transformed the agency into the primary force in national and international scientific progress. This progress has been enabled by the depth, breadth and balance of the space science program. This year's discovery that liquid water persisted on the surface of Mars, the Hubble ultra-deep field image that views infant galaxies within the first 5% of the history of the cosmos, the observation of dramatic solar activity with significant repercussions throughout the solar system, the early successes in Spitzer infrared studies from proto-planetary disks to distant galaxies, and Chandra studies of the destruction of a star by a black hole illustrate the excitement generated by this broad and compelling program. NASA should not step away from this preeminence in science through an overly narrow interpretation of the Exploration initiative. **We strongly recommend that "highest quality science" remain the guiding principle for OSS.**

- We are very pleased that the FY05 budget proposal supports Solar System Exploration, Astronomical Search for Origins, and Living with a Star. These, developed as elements of the OSS Strategic Plan, will continue to produce exciting new discoveries and represent the scientific foundation for the Exploration Initiative. The new budget is, however, leading to significant delays in implementing important

missions within the broader program of scientific exploration laid out in the strategic plan, specifically, key parts of the Sun-Earth Connection and Structure and Evolution of the Universe themes. The delayed science in SEC retards the basic science upon which the LWS program is founded. The delayed science in SEU retards the tremendous advances in developing a fundamental understanding of our universe. **SScAC recommends that NASA keep science in the forefront of the Exploration initiative.**

- **SScAC supports OSS prioritization for proposed new initiatives**, specifically that Einstein Probes and Solar Probe be given highest priority, as a first step in restoring the broad vision of scientific exploration that has been a hallmark of OSS programs in the past. Einstein Probes implement the highest priority science in the "Physics of the Universe: Quarks to Cosmos" NAS report, and Solar Probe was identified as the priority large mission in the Space Physics Decadal Survey of the NAS.

- The Explorer Program has contributed fundamental science over many years and has served as a model for missions of small to moderate scale. SScAC is concerned about the status and fate of this program. **We expect to be fully briefed and have a complete and thorough discussion of Explorer issues at our next meeting.**

- Hubble Space Telescope has just completed a decade of highly successful operation. With two new instruments ready for launch, HST is poised to continue to make major contributions to astronomy in general and the Exploration Initiative in particular. NASA's decision to cancel Servicing Mission 4 will substantially and negatively impact a number of fields in Space Science in terms of new discoveries. If any form of servicing is possible, continuing Hubble science remains exciting and important. We encourage NASA to consider the broadest possible range of servicing options, with the priority being to maximize the science return from HST. If servicing is not possible, operation as long as possible is exciting and important and OSS should mitigate or recover the loss of science (including, e.g., flight of stranded instruments on other spacecraft). **SScAC recommends that OSS investigate ways to sustain the outstanding science successes of HST.**

- Tremendous progress in our understanding of the complex interaction and relationships between elements of the Sun-Solar System, including the sun, its heliosphere, planetary magnetospheres and atmospheres, has been enabled by an existing fleet of spacecraft operating in Earth's geospace. The existence of this fleet is jeopardized by the budget cuts in the SEC MO&DA line. The satellites provide the measurements that feed the fundamental science underlying the understanding and prediction of space weather, an overriding concern of space travelers. **SScAC recommends that options to sustain this irreplaceable portfolio of missions be developed.**

- SScAC is concerned about the relationship between Codes S and T. For example, the splitting of science requirements and technology development on Prometheus/JIMO between the codes may make it a challenge to keep the science priorities for JIMO in the forefront as Code T develops the relevant flight technologies. A strong connection

between Code S mission science requirements and Code T technology development plans is essential. **SScAC recommends that the relationship between Code S and the new Code T be formalized to ensure that the science potential of new technologies is fulfilled.** We also endorse the program of identifying new technology needs within Code S.

- SScAC is concerned about the apparent slip by two years in the launch target for JIMO, associated with the pace of the Prometheus program. **SScAC notes that additional slippage would put the science associated with JIMO well beyond the horizon of the current Solar System decadal survey and the Code S strategic Plan**.

- SScAC is concerned about the increasing length of time and complexity of the launch approval process for missions that use nuclear power sources. This trend could threaten our ability to explore the deep solar system and Mars. **SScAC would like to be briefed on the details of this issue in the near future.**

- The funding profile for the sounding rocket program presented to SScAC is very disturbing. It indicates that the program may collapse from lack of flight opportunities in approximately 18 months. Briefings to the SEUS regarding the balloon program also showed serious problems. Given the value of the programs, the whole of the sub-orbital program should be reexamined. It should be aligned with the science requirements in the strategic plan and prioritized according to its value to the goals of OSS. **SScAC recommends that a briefing be prepared outlining the benefits, capabilities, resource requirements and restructuring options of the sub-orbital program for consideration by the roadmap and advisory committees, including SScAC.**